

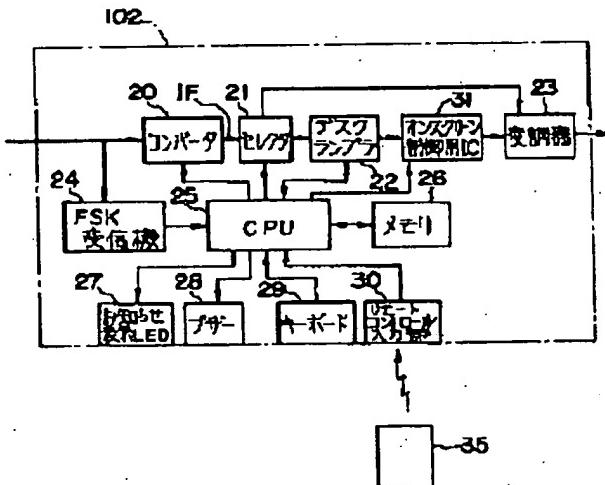
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CATV TERMINAL EQUIPMENT AND CATV SYSTEM**Publication number:** JP5122694**Publication date:** 1993-05-18**Inventor:** KAWASAKI MASAHICO; OGA EIJI; TAKAHASHI TATSUO; TOZAKI RYUSUKE**Applicant:** PIONEER ELECTRONIC CORP**Classification:**

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- european:**Application number:** JP19910281451 19911028**Priority number(s):** JP19910281451 19911028**Report a data error here****Abstract of JP5122694**

PURPOSE: To set a pair rental function for each program and to improve the flexibility of programming by discriminating whether or not a broadcasting program is the authorized one and releasing the scrambling based on the result of discrimination. **CONSTITUTION:** A visual mode storage means 26 receives a visual mode selection input from a keyboard 29 and stores the visual mode selection state. A visual permission discrimination means 25 discriminates whether or not the broadcasting program is the authorized one, that is, whether or not it is the one permitting the descrambling based on the visual condition data corresponding to the broadcasting program to be broadcasted from a CATV center and the visual mode selection state stored in the visual mode storage means 26. A descrambling means 22 releases the scrambling based on the result of discrimination of the visual permission discrimination means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to a CATV (Cable Television or Community Antenna Television) terminal unit and a CATV system.

[0002]

[Description of the Prior Art] A CATV system is a system which provided a subscriber's CATV terminal unit with the independence program or the commercial broadcasting program currently broadcast for between a CATV center and two or more subscribers' CATV terminal units from the epilogue and CATV center side with the cable through the transmission medium. Recently, data communication also came to be performed. Moreover, the bidirectional CATV system which can transmit the signal (uphill signal) from a CATV terminal unit side to a CATV center side has also appeared. It may be called the system CCTV in a school, a hotel, etc. (Closed Circuit TV) among CATV systems, and may distinguish.

[0003]

[Problem(s) to be Solved by the Invention] In the above-mentioned conventional CATV system, it had the pair rental function which limits a viewer according to the contents of the broadcast program. Since a certain specific whole channel was set up as a channel which operates a pair rental function, in order to view and listen to the broadcast program of the channel concerned, the control approach needed to enter the password from a keyboard or remote control equipment, and needed to operate the lock discharge key prepared in the terminal unit, and once needed to cancel the pair rental function. Thereby, while the utilization factor of the channel concerned worsened, there was a trouble that broadcast effectiveness will fall as the whole system.

[0004] Then, it enables it to perform assignment for the purpose of this invention ~~classifying a broadcast program into some grades, and limiting a viewer about each~~. (Specifically, less than 18 years old have X assignment of the ban on less than 18 years-old viewing and listening, R assignment for which company of parents or an adult is needed, it is [parents' monitor] required and not make [view and listen depending on a work / a less than 13-year-old child] PG-13 assignment, etc.) It is possible to set up a pair rental function for every program, and it is in offering the CATV terminal unit and CATV system which can improve the flexibility of programming.

[0005]

[Means for Solving the Problem] In the CATV terminal unit which the 1st invention receives the television signal from a CATV center, and is sent out to a receiving set in order to solve the above-mentioned technical problem The input means for directing the viewing-and-listening mode of the CATV terminal unit concerned, and a viewing-and-listening mode storage means to memorize a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from said input means, It is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. It has a ~~viewing and~~

~~A listening authorization distinction means to distinguish whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, and a descrambling means to cancel a scramble based on the distinction result of said viewing-and-listening authorization distinction means, and constitutes.~~

[0006] Moreover, the CATV center where the 2nd invention transmits a television signal, In the CATV system equipped with the transmission line which transmits the television signal concerned, two or more CATV terminal units which receive said television signal, and the receiving set connected to two or more CATV terminal units concerned Program data concerning a broadcast program to the television signal which should transmit said CATV center, It has a modulation means to superimpose and send out the channel data and program start time data corresponding to the program data concerned. Said CATV terminal unit The input means for directing the viewing-and-listening mode of the CATV terminal unit concerned, and a viewing-and-listening mode storage means to memorize a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from said input means, It is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. A viewing-and-listening authorization distinction means to distinguish whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, A reception-control means to send out the television signal of the channel corresponding to the broadcast program concerned to said receiving set, and a viewing-and-listening prohibition means to forbid projecting of the television signal to said receiving set of said reception-control means based on the distinction result of said viewing-and-listening authorization distinction means are had and constituted.

[0007]

[Function] According to the 1st invention, a viewing-and-listening mode storage means memorizes a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from said input means. In a viewing-and-listening authorization distinction means, whether the broadcast program concerned being a broadcast program to which viewing and listening is permitted, and the broadcast program concerned distinguish [whether it is the broadcast program you may scramble, and] based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. A descrambling means cancels a scramble based on the distinction result of said viewing-and-listening authorization distinction means. Therefore, ~~it can view and listen only to the broadcast program for every broadcast program to which viewing and listening is permitted even in the same channel.~~

[0008] Moreover, the modulation means of a CATV center superimposes the channel data and program start time data corresponding to the program data about a broadcast program, and the program data concerned on the television signal which should be transmitted, and the 2nd invention sends it out to it.

 [0009] Moreover, the viewing-and-listening mode storage means of a CATV terminal unit memorizes a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from an input means. In a viewing-and-listening authorization distinction means, whether the broadcast program concerned being a broadcast program to which viewing and listening is permitted, and the broadcast program concerned distinguish [whether it is the broadcast program you may scramble, and] based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. A viewing-and-listening prohibition means forbids ~~projecting of the television signal to said receiving set of said reception-control means based on the distinction result of a viewing-and-listening authorization distinction means.~~ Therefore, since a CATV center can transmit the broadcast program from which the grade of a pair rental function differs by the same broadcast channel, its utilization ratio of a channel improves. Moreover, a viewer can be taken as the condition that it cannot view and listen only to a broadcast program [can view and listen only to the broadcast program to which viewing and listening is permitted, for example,] not to show a child even

if it is the same channel.

[0010]

[Example] Next, the suitable example of this invention is explained based on a drawing. The CATV structure of a system which is one example of this invention is shown in drawing 1. This CATV system 100 is equipped with the CATV center (head end) 101, two or more CATV terminals 102, and the TV receiving set 3. The CATV center 101 receives a commercial broadcasting program with the antenna 1 for satellites from a satellite 103, or receives the commercial broadcasting program by the ground wave with the antenna 2 for ground waves. Or an access program is created, scramble processing of these television signals is carried out, and distribution service is carried out at each CATV terminal 102 through the transmission-medium trunk 108 which is a transmission line, a trunk amplifier 104, a trunk-bridging amplifier 105, the transmission-medium branch line 109, a turnout 106, and a protector 107. Generally, distribution service is offered by the contract with each user (viewer), and it is a charge.

[0011] It is received by the CATV terminal 102, and after the descrambling processing which returns the scramble processing for ***** prevention is made, the transmitted CATV signal is sent to the TV receiving set 3, and it is viewed and listened to it by the user.

[0012] The configuration of a CATV center is shown in drawing 2. The CATV center 101 is equipped with the antenna 1 for satellites, the BS converter 4 which carries out frequency conversion of the signal for satellites received by this antenna 1 for satellites, the signal processor 5, and the mixer 6. The signal from the antenna 2 for ground waves and the signal processor 7 which receive the broadcast signal by the ground wave is inputted into a mixer 6. Moreover, after the video signal from TV camera 8 and the video signal from a program VTR 11 which were created in the CATV center 101 are processed by the scrambler 9 by the scramble processing for ***** prevention, for example, a GSS (gated sync.suppression) method, they are inputted into a mixer 6 through a modulator 10. Moreover, in band data and the control data based on out band transmission are generated from the control computer 15, with CCE 16, the FSK modulation for out band transmission is performed, in band data are inputted into a modulator and it is transmitted [AM of the voice IF (intermediate frequency) signal is carried out, and].

[0013] Drawing 3 is the block diagram showing the configuration of a CATV terminal. In the usual program broadcast, RF (Radio Frequency) signal from a CATV center is inputted into a converter 20. A converter 20 carries out frequency conversion of the signal of the channel which tuned in the desired channel and was tuned in from the inputted signals, and outputs the intermediate frequency signal IF. The intermediate frequency signal IF is inputted into a descrambler 22 through a selector 21.

[0014] A descrambler 22 descrambles by AM detection extracting the scramble data on which it is superimposed in the intermediate frequency signal IF. The signal which it descrambled is sent to a modulator 23, is in the condition that AM of the video-signal part was carried out where FM modulation of the sound signal part is carried out, and is outputted to TV receiving set as a RF signal. However, since scramble processing is not performed in simultaneous urgent broadcast of the disaster warning of an earthquake and a storm etc., it outputs to a modulator 23 directly from a selector 21, without letting a descrambler 22 pass.

[0015] Here, the configuration of remote control 35 is explained with reference to drawing 4. Remote control 35 is constituted so that various data may be transmitted to the remote control input section 30 with infrared radiation. On the control panel of remote control 35 power button K1 which carries out ON/OFF of the power source of a CATV terminal Menu button K2 for displaying a menu screen order carbon button K3 which performs the directions for purchasing a pay program A channel / response change-over carbon button K4 display carbon button K5 for displaying various information on the TV receiving set 3 en turbo tongue K6 for carrying out the definite input of the various data Clear carbon button K7 memory recall button K8 which reads a memory content Mute button K9 which carries out [voice / of TV receiving set / output] mute The volume rise carbon button K10 and the volume down carbon button K11, The last channel recall button K12 which displays the program of the channel before a channel change-over on TV receiving set, The pair rental carbon button K14 which switches the channel up-and-down carbon button K13, and the pair rental setting mode and the normal mode of a

seesaw format, The mode carbon button K15 which switches the various setting modes in pair rental setting mode, Figure carbon button group KNUM which consists of an authorization/prohibition carbon button K16 which switches the authorization assignment or prohibition assignment in pair rental setting mode (viewing and listening), and ten figure carbon buttons of "1" - "0" carbon button It is had and constituted. In this case, figure carbon button group KNUM Inside, in case "1" - "7" carbon button performs a timer input, it is used as a day-of-the-week carbon button ("SUN", --; "SAT"), respectively, and "0" carbon buttons are used as a carbon button ("SUN" - "SAT") every day. Moreover, in case the channel up-and-down carbon button K13 performs a timer input, it is used as a (PM) carbon button in the (AM) carbon button and the afternoon in the morning. In addition, the key which performs the same actuation as these carbon buttons shall be prepared also in the key panel of the keyboard section 29.

[0016] Next, actuation is explained with reference to drawing 5 thru/or drawing 8.

The operation flow chart at the time of viewing-and-listening mode setting is shown in drawing 5 at the time of viewing-and-listening mode setting.

[0017] Changing into a discharge condition the pair rental functional locking device (not shown) with which the viewer was prepared in the tooth-back side of a CATV terminal unit, (step S1) CPU25 serves as pair rental setting mode by pushing the keyboard section 29 or the pair rental carbon button K14 of remote control 35 (step S2).

[0018] Thereby, a CATV terminal unit is three LEDL(s)1, L2, and L3, as shown in drawing 6 (a). It is the X assignment LEDL1 inside. The light is switched on and it becomes the setting mode of X assignment (step S3).

[0019] Continuously, when a viewer depresses the keyboard section 29 or authorization/prohibition carbon button K16 of remote control 35, the grade of X assignment chooses authorization assignment or prohibition assignment (step S4). This authorization/prohibition carbon button K16 has the composition that authorization assignment and prohibition assignment change whenever it depresses. In connection with this, when authorization assignment is chosen, it is the 7 segment LEDSEG. As shown in drawing 6 (b), when E (Enable) mark is displayed and prohibition assignment is chosen, as shown in drawing 6 (c), d (disable) mark is displayed.

[0020] When the keyboard section 29 or the mode carbon button (setup key) K15 of remote control 35 is pushed next, it is the R assignment LEDL2. The light is switched on and it becomes the setting mode of R assignment (step S5).

[0021] A viewer chooses authorization assignment or prohibition assignment similarly by depressing the keyboard section 29 or authorization/prohibition carbon button K16 of remote control 35 (step S6). In connection with this, when authorization assignment is chosen, as it is shown in the 7 segment LED at drawing 6 (b) and is shown in drawing 6 (c) when E (Enable) mark is displayed and prohibition assignment is chosen, d (disable) mark is displayed.

[0022] If the mode carbon button K15 is pushed next, the PG-13 assignment LED will light up and it will become the setting mode of PG-13 assignment (step S7). A viewer chooses authorization assignment or prohibition assignment again by depressing the keyboard section 29 or authorization/prohibition carbon button K16 of remote control 35 (step S8). In connection with this, when authorization assignment is chosen, it is the 7 segment LEDSEG. As shown in drawing 6 (b), when E (Enable) mark is displayed and prohibition assignment is chosen, as shown in drawing 6 (c), d (disable) mark is displayed.

[0023] If the mode carbon button K15 is pushed next, pair rental mode setting will be ended (step S9), and a setup performed by above-mentioned setting processing will be registered into RAM which memory 26 does not illustrate.

[0024] It escapes from pair rental setting mode by next pushing the pair rental carbon button K14. In order to usually return to a busy condition after that, it changes into a lock condition, locking [of the keylock equipment of the tooth back of a CATV terminal unit].

[0025] Usually, the operation flow chart at the time of viewing and listening is usually shown in drawing 7 at the time of viewing and listening. If the lock key of the tooth back which a CATV terminal unit does not illustrate is changed into a lock condition (step S11), it will usually be in a viewing-and-

listening condition. Then, if a channel to view and listen is tuned in (step S12), CPU25 will take out the rating number RN of the in band data ID as shown in drawing 8 on which the channel is overlapped (step S13), and will take out authorization/prohibition data corresponding to a rating number from RAM (step S14). As it is indicated in drawing 8 as the rating number RN here, it is the number which is equivalent to the grade of the pair rental function specified for every program of the by 1 to 1, for example, X assignment and 2 support to R assignment, and 3 supports [having no assignment of 0 (usually program) and 1] PG-13 assignment. In addition, during the configuration of the in band data ID, the scramble data SD are data used when descrambling the program concerned, for example, assignment called 6dB attenuation and 10dB attenuation is carried out. The program number PN is an identification number for specifying the program concerned.

[0026] Next, CPU25 distinguishes whether the assignment corresponding to the rating number RN concerned is permitted, or it is forbidden (step S15). For example, at the time of above-mentioned viewing-and-listening mode assignment, X assignment and R assignment will be distinguished, if a rating number cannot view and listen to the program of 1 or 2 with the CATV terminal unit concerned supposing it is carrying out prohibition assignment and PG-13 assignment to authorization assignment, and when a rating number can view and listen only to the program of 0 or 3, it will distinguish.

[0027] When the assignment corresponding to the rating number concerned is forbidden, it considers as the condition that viewing and listening is impossible, by forbidding descrambling (step S16). When the rating number concerned is permitted, descrambling is permitted, a television signal is descrambled and it considers as the condition to which it can view and listen (step S17).

[0028] In the above explanation, although only the case where a pair rental function was operated was explained, it becomes possible to view and listen to all broadcast programs by changing into a discharge condition the lock key of the tooth back which a CATV terminal unit does not illustrate.

[0029] The flexibility of programming can be raised, while being able to perform programming by all channels and raising the use effectiveness of a broadcast channel according to this example like the above explanation, since a pair rental function can be freely set up by the CATV terminal unit side by including the information which shows the grade of a pair rental function to in band data even if it is the broadcast program of the same channel. Moreover, although the rating number of a pair rental was added and explained to in band data above, even if it transmits this in an out band by using a program number and a rating number as pair data, it can do the same effectiveness so. Furthermore, in the case of [containing a specific ****] four, intermediary ***** of the rating number was carried out, but even when this is five or more, the same effectiveness can be done so by adding the same rating number as this application.

[0030] [Effect of the Invention] According to the 1st invention, a viewing-and-listening authorization distinction means is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. [whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, and] That is, it distinguishes whether it is the broadcast program which the broadcast program concerned may descramble, and a descrambling means cancels a scramble based on the distinction result of said viewing-and-listening authorization distinction means. Therefore, it can view and listen only to the broadcast program to which viewing and listening is permitted, and in a CATV terminal unit, since viewing and listening becomes impossible automatically as for the program to which viewing and listening is not permitted, also when the program which he does not want to show to a child by the same broadcast channel is broadcast, it can respond easily. Moreover, although it is the same broadcast channel and a child can also view and listen at a certain time, when only parents can view and listen at midnight, the utilization ratio of a viewing-and-listening channel rises.

[0031] According to the 2nd invention, moreover, a viewing-and-listening authorization distinction means It is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side,

and said selection mode storage means. [whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, and] That is, it distinguishes whether it is the broadcast program which the broadcast program concerned may descramble, and a viewing-and-listening prohibition means forbids sending out of the television signal to said receiving set of said reception-control means based on the distinction result of a viewing-and-listening authorization distinction means. Therefore, in a CATV center side, since the broadcast program from which the grade of a pair rental function differs by the same broadcast channel can be transmitted, the utilization ratio of a channel improves. Moreover, a viewer side can be taken as the condition that it cannot view and listen only to a broadcast program [can view and listen only to the broadcast program to which viewing and listening is permitted, for example,] not to show a child even if it is the same channel.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] It is the block diagram showing the configuration of one example of this invention.
[Drawing 2] It is the block diagram showing the configuration of the CATV center in drawing 1.
[Drawing 3] It is the block diagram showing the configuration of the CATV terminal unit in drawing 1.
[Drawing 4] It is drawing showing the appearance of remote control equipment.
[Drawing 5] It is an operation flow chart at the time of viewing-and-listening mode setting.
[Drawing 6] It is the explanatory view of the display condition of a CATV terminal unit.
[Drawing 7] Usually, it is an operation flow chart at the time of viewing and listening.
[Drawing 8] It is the explanatory view of in band data.

[Description of Notations]

- 1 -- Antenna for satellites
- 2 -- Antenna for ground waves
- 3 -- TV receiving set
- 4 -- BS converter
- 5 -- Signal processor
- 6 -- Mixer
- 7 -- Signal processor
- 8 -- TV camera
- 9 -- Scrambler
- 10 -- Modulator
- 11 -- Program VTR
- 15 -- Control computer
- 16 -- Communication controller
- 20 -- Converter
- 21 -- Selector
- 22 -- Descrambler
- 23 -- Modulator
- 24 -- FSK receiver
- 25 -- CPU
- 26 -- Memory
- 27 -- Information LED
- 28 -- Buzzer
- 29 -- Keyboard section
- 30 -- Remote control input section
- 35 -- Remote control equipment
- 100 -- CATV system
- 101 -- CATV center
- 102 -- CATV terminal unit

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CLAIMS

[Claim(s)]

[Claim 1] In the CATV terminal unit which receives the television signal from a CATV center and is sent out to a receiving set. The input means for directing the viewing-and-listening mode of the CATV terminal unit concerned, and a viewing-and-listening mode storage means to memorize a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from said input means. It is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. The CATV terminal unit carried out [having had a viewing-and-listening authorization distinction means to distinguish whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, and a descrambling means to cancel a scramble based on the distinction result of said viewing-and-listening authorization distinction means, and] as the description.

[Claim 2] The CATV center which transmits a television signal, and the transmission line which transmits the television signal concerned, In the CATV system equipped with two or more CATV terminal units which receive said television signal, and the receiving set connected to two or more CATV terminal units concerned. Program data concerning a broadcast program to the television signal which should transmit said CATV center, It has a modulation means to superimpose and send out the channel data and program start time data corresponding to the program data concerned. Said CATV terminal unit The input means for directing the viewing-and-listening mode of the CATV terminal unit concerned, and a viewing-and-listening mode storage means to memorize a viewing-and-listening mode selection condition in response to the viewing-and-listening mode selection input from said input means. It is based on the viewing-and-listening mode selection condition memorized by the viewing-and-listening condition data corresponding to the broadcast program transmitted from a CATV center side, and said selection mode storage means. A viewing-and-listening authorization distinction means to distinguish whether the broadcast program concerned is a broadcast program to which viewing and listening is permitted, A reception-control means to send out the television signal of the channel corresponding to the broadcast program concerned to said receiving set, The CATV system characterized by having a viewing-and-listening prohibition means to forbid sending out of the television signal to said receiving set of said reception-control means based on the distinction result of said viewing-and-listening authorization distinction means.

[Translation done.]

103 -- Satellite
104 -- Trunk amplifier
105 -- Trunk-bridging amplifier
106 -- Turnout
107 -- Protector
108 -- Transmission-medium trunk
109 -- Transmission-medium branch line
L1 -- X assignment LED
L2 -- R assignment LED
L3 -- PG-13 assignment LED
SEG -- Seven segments and LED

[Translation done.]